2014

Test 2094: Case IH Steiger 470

Nebraska Tractor Test Laboratory
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NEBRASKA OECD TRACTOR TEST 2094 - SUMMARY 959
CASE IH STEIGER 470 DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Diesel Consumption Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	D.E.F. Consumption Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption Gal/hr *(l/h)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1160 rpm)						
417.16 *(311.07)*	2101	24.08 *(91.14)*	0.405 *(0.247)*	17.33 *(3.41)*	1.85 *(7.02)*	
Maximum Power (1 hour)						
468.35 *(349.25)*	1901	25.27 *(95.66)*	0.379 *(0.230)*	18.53 *(3.65)*	2.21 *(8.37)*	
Standard Power Take-off Speed (1000 rpm)						
459.94 *(342.97)*	1811	24.45 *(92.53)*	0.373 *(0.227)*	18.82 *(3.71)*	2.12 *(8.01)*	
VARYING POWER AND FUEL CONSUMPTION						
417.16 *(311.07)*	2101	24.08 *(91.14)*	0.405 *(0.247)*	17.33 *(3.41)*	1.85 *(7.02)*	Air temperature
362.45 *(270.28)*	2146	21.52 *(81.46)*	0.417 *(0.254)*	16.84 *(3.32)*	1.66 *(6.29)*	73°F *(23°C)*
272.67 *(203.33)*	2155	17.24 *(65.24)*	0.444 *(0.270)*	15.82 *(3.12)*	1.28 *(4.84)*	Relative humidity
182.74 *(136.27)*	2163	13.06 *(49.42)*	0.502 *(0.305)*	14.00 *(2.76)*	0.89 *(3.36)*	45%
91.74 *(68.41)*	2176	9.04 *(34.23)*	0.692 *(0.421)*	10.15 *(2.00)*	0.52 *(1.95)*	Barometer
2.17 *(1.61)*	2185	5.29 *(20.02)*	17.156 *(10.435)*	0.41 *(0.08)*	0.26 *(1.00)*	29.01" Hg *(98.25 kPa)*

Maximum torque - 1514 lb.-ft. *(2053 Nm)* at 1400 rpm
Maximum torque rise - 45.2%
Torque rise at 1681 engine rpm - 35%
Power increase at 1901 engine rpm - 12.3%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F(°C) cool-ing med	Temp.°F(°C) Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—4th Gear										
387.67 *(289.08)*	29229 *(130.02)*	4.97 *(8.00)*	2100	3.4	0.436 *(0.265)*	16.11 *(3.17)*	0.040 *(0.024)*	202 *(94)*	63 *(17)*	28.66 *(97.05)*
75% of Pull at Maximum Power—4th Gear										
300.22 *(223.87)*	21896 *(97.40)*	5.14 *(8.27)*	2151	2.3	0.461 *(0.280)*	15.23 *(3.00)*	0.041 *(0.025)*	203 *(95)*	75 *(24)*	28.65 *(97.02)*
50% of Pull at Maximum Power—4th Gear										
202.87 *(151.28)*	14604 *(64.96)*	5.21 *(8.38)*	2161	1.5	0.509 *(0.310)*	13.80 *(2.72)*	0.041 *(0.025)*	204 *(95)*	77 *(25)*	28.64 *(96.99)*
75% of Pull at Reduced Engine Speed—8th Gear										
299.40 *(223.26)*	21969 *(97.72)*	5.11 *(8.22)*	1407	2.4	0.389 *(0.236)*	18.07 *(3.56)*	0.040 *(0.024)*	204 *(95)*	76 *(25)*	28.65 *(97.02)*
50% of Pull at Reduced Engine Speed—8th Gear										
202.86 *(151.27)*	14588 *(64.89)*	5.22 *(8.39)*	1424	1.5	0.419 *(0.255)*	16.75 *(3.30)*	0.030 *(0.018)*	202 *(94)*	78 *(25)*	28.64 *(96.99)*

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: September 11- 22, 2014

Manufacturer: CNH Industrial America LLC, 700 State St. Racine, Wi. 53404 USA

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8434 **Fuel weight** 7.022 lbs/gal *(0.842 kg/l)* **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal *(1.087 kg/l)* **Oil SAE** 10W40 **API service classification** CJ-4 **Transmission lubricant** Akcela Hy-Tran Ultraction fluid **Hydraulic and axle lubricant** Akcela Hy-Tran Ultraction fluid **Total time engine was operated:** 18.0 hours

ENGINE: Make FPT Industrial Diesel **Type** six cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** 000010353 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 5.315" x 5.906" *(135.0 mm x 150.0 mm)* **Compression ratio** 16.5 to 1 **Displacement** 786 cu in *(12880 ml)* **Starting system** 24 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, seperate radiators for hydraulic and transmission oil **Fuel filter** two paper elements **Exhaust** DOC (diesel oxidation catalyst) and SCR (selective catalyst reduction) with a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 160.9 - 170.9 lb/h *(73.0 -77.5 kg/h)* **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 21.8 - 24.7 psi *(150 - 170 kPa)* as measured 23.3 psi *(160 kPa)*

CHASSIS: Type four wheel drive with duals **Serial No.** *ZEF300725* **Tread width** rear 60.0" *(1524 mm)* to 130.0" *(3302 mm)* front 60.0" *(1524 mm)* to 130.0" *(3302 mm)* **Wheelbase** 148.0" *(3759 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 2.97 *(4.78)* second 3.58 *(5.76)* third 4.32 *(6.95)* fourth 5.20 *(8.37)* fifth 5.97 *(9.61)* sixth 6.56 *(10.56)* seventh 7.20 *(11.58)* eighth 7.90 *(12.72)* ninth 8.69 *(13.98)* tenth 9.55 *(15.37)* eleventh 10.46 *(16.84)* twelfth 11.50 *(18.51)* thirteenth 13.20 *(21.25)* fourteenth 15.91 *(25.60)* fifteenth 19.21 *(30.91)* sixteenth 23.13 *(37.23)* reverse 4.50 *(7.24)*, 9.05 *(14.57)* **Clutch** multiple wet disc electrohydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by foot pedal **Steering** hydrostatic and articulated

DRAWBAR PERFORMANCE AT 2100 ENGINE RPM

DRAWBAR POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					1st Gear					
300.48	43495	2.59	2142	13.5	0.499	14.08	0.045	204	64	28.75
(224.07)	*(193.48)*	*(4.17)*			*(0.304)*	*(2.77)*	*(0.028)*	*(96)*	*(18)*	*(97.36)*
					2nd Gear					
365.08	42703	3.21	2100	9.7	0.464	15.13	0.041	205	64	28.74
(272.24)	*(189.95)*	*(5.17)*			*(0.282)*	*(2.98)*	*(0.025)*	*(96)*	*(18)*	*(97.33)*
					3rd Gear					
384.64	35392	4.08	2100	4.6	0.440	15.95	0.040	203	68	28.75
(286.82)	*(157.43)*	*(6.56)*			*(0.268)*	*(3.14)*	*(0.024)*	*(95)*	*(20)*	*(97.36)*
					4th Gear					
387.67	29229	4.97	2099	3.4	0.436	16.11	0.040	202	63	28.66
(289.08)	*(130.02)*	*(8.00)*			*(0.265)*	*(3.17)*	*(0.024)*	*(94)*	*(17)*	*(97.05)*
					5th Gear					
387.68	25307	5.75	2100	2.7	0.437	16.08	0.040	203	60	28.67
(289.09)	*(112.57)*	*(9.25)*			*(0.266)*	*(3.17)*	*(0.025)*	*(95)*	*(16)*	*(97.09)*
					6th Gear					
390.18	23136	6.33	2100	2.4	0.432	16.27	0.040	203	61	28.67
(290.95)	*(102.91)*	*(10.18)*			*(0.263)*	*(3.21)*	*(0.025)*	*(95)*	*(16)*	*(97.09)*
					7th Gear					
387.17	20890	6.95	2099	2.1	0.437	16.08	0.039	203	65	28.67
(288.71)	*(92.92)*	*(11.18)*			*(0.266)*	*(3.17)*	*(0.024)*	*(95)*	*(18)*	*(97.09)*
					8th Gear					
389.50	19098	7.65	2099	1.9	0.434	16.18	0.038	203	71	28.67
(290.45)	*(84.95)*	*(12.31)*			*(0.264)*	*(3.19)*	*(0.023)*	*(95)*	*(22)*	*(97.09)*
					9th Gear					
385.65	17158	8.43	2100	1.7	0.429	16.35	0.038	202	73	28.66
(287.58)	*(76.32)*	*(13.57)*			*(0.261)*	*(3.22)*	*(0.023)*	*(94)*	*(23)*	*(97.05)*

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At no load in 4th gear	73.9
Bystander in 16th gear	87.8

TIRES AND WEIGHT

	Tested Without Ballast
Rear Tires - No., size, ply & psi *(kPa)*	Four 480/95R50;***;9*(65)*
Front Tires - No., size, ply & psi *(kPa)*	Four 480/95R50;***;12*(85)*
Height of Drawbar	21.0 in *(535 mm)*
Static Weight with operator - Rear	17920 lb *(8128 kg)*
- Front	24545 lb *(11134 kg)*
- Total	42465 lb *(19262 kg)*

Power take-off MY 2014 - 1000 rpm at 1998 engine rpm, MY 2015 - 1000 rpm at 1811 engine rpm **Unladen tractor mass** 42290 lb *(19182 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the primary fuel filter was maintained at 110°F *(43°C)*. The performance figures on this Summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2094**, Nebraska Summary 959, December 19, 2014.

Roger M. Hoy
Director

M.F. Kocher
J.D. Luck
P.J. Jasa
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 1900 RPM

MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					1st Gear					
300.99 *(224.44)*	43364 *(192.89)*	2.61 *(4.19)*	2143	13.0	0.498 *(0.303)*	14.10 *(2.78)*	0.045 *(0.028)*	204 *(96)*	65 *(18)*	28.75 *(97.36)*
					2nd Gear					
365.86 *(272.82)*	42347 *(188.37)*	3.24 *(5.21)*	2104	8.8	0.462 *(0.281)*	15.20 *(3.00)*	0.041 *(0.025)*	205 *(96)*	64 *(18)*	28.74 *(97.33)*
					3rd Gear					
411.62 *(306.94)*	41051 *(182.60)*	3.76 *(6.05)*	1985	6.8	0.428 *(0.261)*	16.40 *(3.23)*	0.044 *(0.027)*	204 *(95)*	69 *(20)*	28.75 *(97.36)*
					4th Gear					
427.20 *(318.56)*	36225 *(161.13)*	4.42 *(7.11)*	1900	5.2	0.416 *(0.253)*	16.88 *(3.33)*	0.042 *(0.025)*	203 *(95)*	68 *(20)*	28.75 *(97.36)*
					5th Gear					
432.36 *(322.41)*	31460 *(139.94)*	5.15 *(8.29)*	1900	4.0	0.412 *(0.250)*	17.06 *(3.36)*	0.043 *(0.026)*	203 *(95)*	61 *(16)*	28.66 *(97.05)*
					6th Gear					
434.61 *(324.09)*	28661 *(127.49)*	5.69 *(9.16)*	1900	3.1	0.409 *(0.249)*	17.19 *(3.39)*	0.043 *(0.026)*	203 *(95)*	62 *(17)*	28.67 *(97.08)*
					7th Gear					
433.19 *(323.03)*	25982 *(115.57)*	6.25 *(10.06)*	1900	2.8	0.409 *(0.249)*	17.18 *(3.38)*	0.042 *(0.025)*	203 *(95)*	65 *(18)*	28.67 *(97.08)*
					8th Gear					
435.16 *(324.50)*	23697 *(105.41)*	6.89 *(11.09)*	1899	2.5	0.408 *(0.248)*	17.23 *(3.39)*	0.042 *(0.025)*	203 *(95)*	67 *(19)*	28.66 *(97.05)*
					9th Gear					
432.87 *(322.79)*	21409 *(95.23)*	7.58 *(12.20)*	1898	2.2	0.412 *(0.250)*	17.05 *(3.36)*	0.041 *(0.025)*	203 *(95)*	73 *(23)*	28.67 *(97.08)*
					10th Gear					
430.62 *(321.11)*	19354 *(86.09)*	8.34 *(13.42)*	1900	2.0	0.415 *(0.252)*	16.93 *(3.33)*	0.041 *(0.025)*	203 *(95)*	73 *(23)*	28.67 *(97.08)*

HYDRAULIC PERFORMANCE

CATEGORY: IVN
Quick Attach: yes
OECD Static test
Maximum force exerted through whole range: 21903 lbs *(97.4 kN)*

Three outlet sets combined

	Standard pump	High flow pump
i) Sustained pressure of the open relief valve:	2877 psi *(198 bar)*	3042 psi *(210 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM *(165.8 l/min)*	59.0 GPM *(223.4 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM *(163.7 l/min)*	56.2 GPM *(212.9 l/min)*
Delivery pressure:	2526 psi *(174 bar)*	2649 psi *(183 bar)*
Power:	63.7 HP *(47.5 kW)*	86.9 Hp *(64.8 kW)*

Single outlet set

ii) Pump delivery rate at minimum pressure and rated engine speed:	42.8 GPM *(162.2 l/min)*	48.4 GPM *(183.4 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	42.7 GPM *(161.6 l/min)*	44.6 GPM *(168.9 l/min)*
Delivery pressure:	2024 psi *(139 bar)*	2091 psi *(144 bar)*
Power:	50.4 HP *(37.6 kW)*	54.4 Hp *(40.6 kW)*

TwinFlow system

Two outlet sets combined

	Standard pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2877 psi *(198 bar)*	2855 psi *(197 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM *(165.8 l/min)*	57.3 GPM *(217.0 l/min)*
Combined flow:	101.1 GPM *(382.8 l/min)*	
iii) Pump delivery rate at maximum hydraulic power:	43.3 GPM *(163.7 l/min)*	56.4 GPM *(213.6 l/min)*
Delivery pressure:	2526 psi *(174 bar)*	2479 psi *(171 bar)*
Power:	63.7 HP *(47.5 kW)*	81.6 Hp *(60.9 kW)*

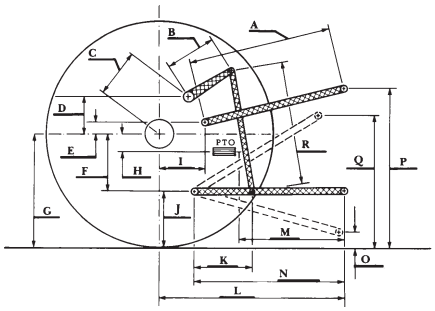
Two outlet sets combined

	High flow pump	TwinFlow pump
i) Sustained pressure at compensator cutoff:	2993 psi *(206 bar)*	2855 psi *(197 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	61.0 GPM *(230.9 l/min)*	57.3 GPM *(217.0 l/min)*
Combined flow:	118.3 GPM *(447.9 l/min)*	
iii) Pump delivery rate at maximum hydraulic power:	56.7 GPM *(214.7 l/min)*	56.4 GPM *(213.6 l/min)*
Delivery pressure:	2517 psi *(174 bar)*	2479 psi *(171 bar)*
Power:	83.3 HP *(62.1 kW)*	81.6 Hp *(60.9 kW)*

HITCH DIMENSIONS AS TESTED - NO LOAD

	inch	*mm*
A	39.0	*990*
B	30.7	*780*
C	27.9	*709*
D	26.5	*673*
E	13.5	*342*
F	16.3	*415*
G	38.2	*970*
H	2.6	*66*
I	21.2	*538*
J	21.9	*555*
K	30.5	*775*
L	58.5	*1487*
*L'	65.8	*1671*
M	53.6	*1361*
N	43.0	*1093*
O	9.1	*230*
P	52.6	*1335*
Q	46.5	*1181*
R	39.4	*1000*

*L' to Quick Attach ends



Case IH STEIGER 470 Diesel

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